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BRANCH OF RESEARCH

MONTHLY REPORT

OF

FOREST EXPERIMENT STATIONS
FOREST PRODUCTS
FOREST ECONOMICS
RANGE RESEARCH

APR - 1928

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BRANCH OF RESEARCH

April, 1928

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EDITING VS. RE-EDITING

T. T. Munger

In the February Monthly Report of the Branch of Research "The Editor" sympathetically quotes a member of a Board of Review, who is ch provoked at having received for reading a manuscript that was t all it should be, and blames the Director for not having rewritten it before it left his hands. I do not know what Station perpetrated this manuscript, perhaps it came from here; it does not matter.

I merely rise to plead that the author be given a chance to report his research in his own way at least to the Board of Review, and his manuscript be subjected to the minimum number of separate revisions before it reaches the printer.

My conception of the Board of Review is that it acts like the readers of a publishing house. It, through its three or four individual members, expresses opinions as to whether a manuscript is too long, or too sketchy, too dull or too superficial, whether it really merits publication, whether it is sound, its data are sufficient and satisfactorily presented, its general arrangement is logical. On all of these points the Director of the Station must have ideas and if unfavorable they are inevitably at variance with the opinion of the author, who, having done his best, naturally thinks that his manuscript is just right, i.e. it suits his taste. Now suppose the Director thinks this manuscript is better than the average of bulletins, but for his taste it is too long, has too many tables and not enough popular elementary discussion. Our aforementioned complainant would have said Director take the manuscript and rewrite it as he thinks it ought to be. It would then go to the Board of Review (under the author's signature) but lacking in tables and some discussion which the author thinks essential, and with the addition of paragraphs by the Director in a style foreign to the accredited author. Now the Board of Review of four reads this once-rewritten manuscript. One of hem thinks it is OK as it is, two think it is too short, lacks tables, nd is too popular in treatment, in other words, they would probably ave preferred the author's original edition, and the fourth has criticisms on other points only.

Would it not have been better to send this manuscript to the Board of Review as the author wrote it - assuming, of course, that throughout its preparation the author had had the benefit of the Director's best counsel and criticisms on specific passages - and

(Over)

then on its return let the Director add his own judgment to that of the Board, so that the manuscript would be rewritten only on e basis of the combined judgment of several. Then it would be .ven the very best revision by Director and author working together d go to the Editor as good as the Station can make it, after the benefit of the advice of the Board.

Give the author a chance, let his work speak for him at least to the Board of Review! The matter of expression is a matter of personal taste or individuality. Do not let us smother individuality to the extent that every piece of work that goes outside the Station, even only to the Board of Review, must be shaped to fit the taste of the Director and written exactly as he would write it himself. Furthermore, as a matter of efficiency: If the Director has to revamp and polish every manuscript before as well as after it goes to the Board of Review, that means double editorial work on his part and on the part of the author, double typing, etc. Everybody loses - except perhpas the three or four members of the Board of Review. These men ought to be able to pass on the general suitability and sufficiency of a manuscript even if it has some crude diction, verbosity, amateurish expressions. Why should the Director spend time editing all of these out if the Board rules the manuscript wholly unfit for publication or needing complete revamping?

The contributor to the February Monthly Report seems to think the Board of Review cannot perform its function if a manuscript has "distressing encumbrances of poor composition." I can hardly conceive a bulletin by any one considered worthy of assignment to such a job being so bad that the Board could not pass upon its fundamental merits and deficiencies. They ought to be able to see past the split infinitives and faulty punctuation. They are not editors and need not feel the responsibility of calling attention to purely editorial changes.

I say let the Director be just as helpful as he can to an author while the manuscript is in preparation, but let us not belittle authorship by revamping everything to the Director's personal taste before any other person has had a chance to see his work. Good writing will not be encouraged in that way. Genius would certainly be killed by that method, and even the ordinary person's possibilities are likely to be smothered rather than stimulated by such surveillance.

NOTE ON ABOVE

Extracts from Mr. Clapp's "RS, Supervision Publications" letter of September 21, 1923:

"The third responsibility of authors is for the form of the report itself ..... one qualification is the ability to present the facts in

a clear, convincing, logical and wellrounded out report. This means that reports which are illogical in arrangement and slip-shod in thier English or inconclusive and unconvincing in the handling of the subject, are below the standards which it is reasonable to expect from competent research men.

"From now on no investigator should submit a report to the Director of a station for transmission unless it conforms to the standards of composition outlined.....Ability to write becomes almost as essential a part of the equipment of an investigator.....as ability to do research.

"Directors must also assume a much greater responsibility in the future than in the past for reports prepared at their station.....A large amount of additional work has been done in the Branch on reports which should never have been presented in their form.

"The functions of the members of the Board of Review will be to read the report critically with particular reference to the form and character of presentation of the data and the conclusions.

"The Forest Service in the past has maintained high standards in its publications. We want in the future to maintain these standards, or even, if it is reasonably possible, to raise them."

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See also the Forester's memorandum of October 5, 1922, on Standards and Responsibility in Reports for Departmental publication sent the Stations October 9, 1922.

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FOREST EXPERIMENT STATIONS

Washington

Congress

The long awaited, and much desired McSweeney Bill passed the House on May 12 with one minor amendment which was not contained in the McNary Senate Bill which passed the Senate on April 17. The vote on the McSweeney Bill under unanimous consent came as a surprise and the bill was passed without record vote. On May 14 the Senate agreed to the House amendment and the bill now goes to the President for signature. As the McSweeney Bill outlines a ten-year program, the various forest research units participating will probably include in their 1930 estimates increases for 10 per cent of the difference in the amount carried by the bill and that now received. The passage of the bill without opposition in either House and almost without question is remarkable, as is also the fact that the bill received favorable consideration in the first sitting of Congress in which the bill was an active issue.

The Agricultural Appropriation Bill has passed without the amendment put in the bill on the Senate floor to provide for an increase of $20,000 for the Lake States Station. This amendment was eliminated in a meeting of the conferees of both Houses. However, an increase of $1220 for the Lake States Station put earlier in the bill by the House Committee, remained throughout the entire life of the bill. This is the only increase for Silvicultural Investigations. An increase in the bill to provide for an expansion of the grazing research in the Southwest also was lost in the Conference. The Agricultural Bill provides $10,000 this year for pathological work in cooperation with the Southern Forest Experiment Station. The Office of Forest Pathology is planning on the assignment of two pathologists to New Orleans, One of these will probably work upon forest tree diseases and the other upon decay in woods.

Details

After spending the winter in Washington, Mr. Pearson left by the way of Asheville and New Orleans for the Southwest. While in Washington Pearson was of great assistance in the general management and conduct of the work of the office and in reviewing manuscripts. Buell, from the Appalachian Station, who has been in for the greater part of the winter on the oak study and then on a method of cutting study analysis, also left for his Station, and MacKinney came to Washington to work up the

results of the extensive surveys made in the Coastal Plain. This work is being prosecuted on the machine tabulator. L. I. Barrett, of the Southern Station, returned to Washington after a visit in Ohio, and later rejoined the field party of the Southern Station in South Carolina.

E. R. Martell, Junior Forester borrowed temporarily from D-7, left the middle of April for his home to undergo an operation. His place will be filled in June by the transfer of V. C. Clements, Junior Forester at the California Forest Experiment Station.

A conference was held the week of April 16 between Forbes, McCarthy and Frothingham and questions on the oak growth and yield study were settled. This study, which is not on an active basis between the three stations, will cover most of the eastern United States. During this same week, the programs for all three stations were gone over and provisional work for the two new stations was adopted.

Miscellaneous

The attention of the stations is called to the "NuAce" mounting corners for mounting photographs. These are more practicable and have several advantages over the Engel corners ordinarily used. The "NuAce" do not deface pictures, and it will save much trouble and reprinting of damaged pictures if the stations would use them in their reports. The price is the same as the Engel corners and probably can be purchased locally.

Library

During April, there were 867 loans of books and periodicals from the library, and 123 members of the Service and others consulted the library in person.

The number of books and articles indexed for the catalogue last month was 284.

NORTHEASTERN FOREST EXPERIMENT STATION

Boyce spent three days near Ipswich and Hamilton, Massachusetts and East Greenwich, Rhode Island, with representatives of the Office of Forest Pathology, Bureau of Plant Industry, Harvard University, and the

Massachusetts Forestry Association, examining planted Japanese larch and Douglas fir infected with European larch canker introduced on nursery stock from Europe. The serious aspect of the situation is the presence of the parasite on Douglas fir, since there is an unbroken belt of tamarack reaching across Canada into the native range of Douglas fir on the Pacific Coast, where extensive stands of pure Douglas fir together with the mild moist climate of that region afford ideal conditions for a disastrous epidemic of an introduced parasite. In addition, the Douglas fir needle cast fungus was found abundantly on Douglas fir. Whether this was introduced from its native home in the western United States, or elsewhere, is problematical, but it serves as another example of the dangers attendant on the movement of nursery stock.

On April 26, the station was visited by three Russians: Mr. V. Tichatchek, chief of the Forestry Division of the Ural Mines; Mr. Alexander Karchewski, a mining engineer from Moscow; and Mr. H. B. Mazur of the lumber division of the Amtorg Trading Corporation, New York. Mr. Tichatchek and Mr. Karchewski are on a trip through the principal forest regions of the United States, and will undoubtedly visit several of the experiment stations. They are particularly interested in experiment station organization and slash disposal studies. Mr. Tichatchek is a member of the faculty of a new forest school recently organized in Russia.

Behre submitted his resignation, effective April 15, though he will continue on a part-time basis until he completes his form class study.

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CENTRAL STATES FOREST EXPERIMENT STATION

General

The latter part of this month finds field work under way with a party in Southern Ohio, one in Maryland and one man working in the southern end of the Piedmont Plateau. Office computation of the oak study was temporarily suspended for this work.

Meyer and Day who were in the south-western part of Ohio working on the study of woodlot grazing, attended the annual meeting of the Ohio Academy of Science at Cincinnati.

Meyer and Kellogg made one trip of three days through the northwestern section of Ohio on a reconnaissance of plantations and woodlots. As a result of an offer made to the State Forester, Kellogg assisted in a demonstration planting carried out by the High School of Hopedale.

The Mead Pulp and Paper Company took advantage of dry weather conditions to burn about twenty acres of cut-over brush land southeast of Chillicothe early in the month. A permanent sample plot had been previously established on this area to study the recovery of sprout growth following the fire. McCarthy and Kellogg were present at the time the area was burned. The windrows of dry two-year-old slash created a hot fire, which consumed many of the small green sprouts, and even melted some of the aluminum tags attached at breast height to live trees on the plot.

Oak Study

Day, who had returned early in the month from an assignment in Washington, accompanied McCarthy and Hanley to southern Ohio in the vicinity of Ironton, where an examination was made of some of the plots previously established in second growth stands of oak. The purpose of this inspection was to familiarize both Day and Hanley, who are to work independently on oak stands, with the character of plots previously used in the oak study. It also gave opportunity to pick out areas for subsequent measurement. Later in the month Hanley and Bower returned to this section and began the measurement of additional hard wood plots in which oak constituted less than 75% of the stand by number. Day returned during the latter part of the month to Maryland, starting oak work in Cecil County, assisted by Schnur from the Allegheny Station. This party was visited by McCarthy and Forbes following the conference on the station programs at Washington. The second growth hardwood lands owned by the Whittaker Iron Company have been severely cut over in places during the last four years, so that many stands of oak previously measured for yield now have openings created by the cutting of oak tie timber and dead chestnut.

Average height and age measurements were plotted from the two hundred and eighty four permanent plots already secured. This shows a dispersion of data which is unsatisfactory in the poorest and best sites, also below fifteen years of age and above ninety years of age. Field parties have been furnished with this diagram and will endeavor to complete the records for these ages and site classes. Bower completed a study of general height-diameter curves for use in applying value tables to the plots. These were forwarded to Washington.

Station Program

The Station program was completed and forwarded to Washington early in the month. Subsequently, Directors of the Allegheny, Appalachian and Central States Forest Experiment Stations met in Washington. This Station will have three major projects for the current year. (1) The continuation of the study of second growth stands of oak, the plan for which has been revised to include stands containing less than 75% of oak down to stands containing as low as 30% oak. This modification of the original oak study has been made to determine the influence upon yield through the inclusion of other species. (2) A study of the older plantations, many of which were planted early throughout Illinois, Iowa and Missouri. It will also include the general planting carried on during the past fifteen years by State forest agencies. (3) The study of the influence of grazing upon wood lots. In addition to these three projects, two others are included in the program to permit cooperation with other agencies in the station's territory. One of these, a type study, is a fundamental study needed early in the work of the station. The other, a study of methods of cutting, has been recognized as a project to allow preliminary work upon it. Neither of these latter two projects will take much of the Station's time during the current year.

Personnel

The Station has succeeded in securing a permanent Stenographer-Clerk through the appointment of Miss Ruth G. Ent, who fills the place temporarily occupied by Mrs. Grace P. Bonner.

Robert K. Winters, who has been on leave taking advanced work in the University of Michigan, returns as Junior Forester to work with this Station during the summer.

Two additional men will report for work early in June: Harold F. Morey, who worked with this Station last summer, and Robert B. Gordon, who is now taking advanced work in the Ohio State University.

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LAKE STATES FOREST EXPERIMENT STATION

The field season opened rather late this spring. An attempt to start the field work by April 15 in Wisconsin had to be given up on account of snow yet on the ground. Toward the end of the month, however, three field projects were under way, the opening of the branch station at Ruse, the fire hazard study in Wisconsin, and the re-examination and completion of the permanent sample plots on the Minnesota National Forest. By the early part of May, it is hoped the field work will be in full sway. The month on the whole was characterized by strenuous efforts to clean up the winter work.

Bates completed and transmitted to Washington his manuscript, "The Natural Reproduction of Lodgepole Pine on Experimental Cutting Areas in the Central Rocky Mountains," and also prepared and weighed about 155 samples of Norway pine seed from different sources for storage experiment. The greenhouse germination tests and the growth tests in soils with the natural profiles reconstructed are continued.

Mowat has finished, as far as the data permitted, the construction of local volume tables for the northern hardwoods, and prepared a map of the half section of the cut-over land at Ruse.

The field notes of permanent sample plots were transferred to permanent office forms, all except a few reproduction plots. The transfer of these was postponed until an acceptable permanent form is developed. The Station hopes that such a form, which is at present not available and which is very desirable, may soon be developed either at this or some other Station.

Averell has been working on the results of the leaf litter study. Some leaf litter analyses of the annual accumulation and particularly those of the total leaf litter accumulation are not yet completed by the Division of Soils. The paper, it is hoped, may be completed by Zon and Averell some time during the summer.

The State Department of Agriculture of Wisconsin, which is conducting a land economic inventory, requested the assistance of the Station in supplementing its work with growth data. The plan for such a study is now under consideration, and when completed will be turned over to a forester selected by the Station but paid by the Wisconsin Conservation Commission. Mr. Bordner, who is in charge of the land economic inventory, visited the Station for a conference with the staff. Mr. Sherman, at the suggestion of the Station, attended the meeting of the Bayfield County Board at Washburn, Wisconsin, and the prospect for the establishment of a National Forest of some 125,000 acres, using the tax delinquent land of the county as a

nucleus, is promising. It is of interest that the land economic inventory was conducted last year in Bayfield County, and its surveys and maps may be available in connection with the establishment of the National Forest.

The Director, speaking as a plain citizen of the State of Minnesota, over the radio, referred to the deplorable condition of the State-owned forest lands, which are being logged without any provision for the future. The papers made a feature of the talk and called upon the Chairman of the Conservation Commission, Grover Conzet, and the State Auditor for comment. The Commissioner of Forestry and Fire Prevention, who is also the Chairman of the Conservation Commission, publicly admitted the justice of the criticism, but the State Auditor referred to the radio talk as absurd and dubbed the Director a "self-styled expert." He promised to answer the criticism in full, but although it is nearly two weeks since the Statement was made, no specific reply has been given out by the Auditor. Meanwhile, the Station made some new friends by its stand.

American Forest Week, except for an enthusiastic meeting of the Minneapolis Hoo Hoo Club, at which representatives from other luncheon clubs were present, passed rather quietly. The two contributions from the Station, one by Averell on "Forest Week in Sweden" (illustrated), and the other by the Director on "A Glance into the Future of Forestry in Minnesota," appeared in the papers.

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APPALACHIAN FOREST EXPERIMENT STATION

General

Field trips were made during April by Scholz, who spent three weeks for the Central States Station in North Carolina, South Carolina, northern Georgia, and Alabama, on a search for second-growth oak yield plots; and by Korstian, on cooperative work with the Southern Station in South Carolina. Frothingham spent three weeks on detail at the Washington Office, which ended with the joint program conference of the Appalachian, Central States, and Allegheny Stations. Buell completed, at Washington, the preliminary runs of punch cards for the extensive survey of hardwood reproduction on cut-over areas, and returned to Asheville on the 27th.

The outstanding event of the month was the beginning of biological work at the Station, to be discussed later.

During American Forest Week, radio talks were broadcast from Station WWNC, Asheville, by Arthur H. Howell, of the United States Biological Survey, and Ralph M. Nelson, Assistant Pathologist attached to the Station. The titles were "Relation of the Forest to Wild Animal Life," and "Protection of the Forest from Disease," respectively. These talks were in a series of five on forestry subjects, arranged by W. K. Beichler, District Forester of the North Carolina State service.

The Station had an interesting and stimulating visit from Mr. Koehler, in charge of the Section of Wood Technology, Forest Products Laboratory. Closer coordination between the Laboratory's wood technology studies and the work of the experiment station was discussed in detail. Visits were made to the Biltmore thinning plots and the Bent Creek Experimental Forest.

Mill Scale Study

Substantial progress was made on the plans for the cooperative mill scale study to be conducted in the Southern Appalachian region by the Forest Products Laboratory, District 7, and the Appalachian Forest Experiment Station. Garver and Miller of the Laboratory visited the region during the month and conferred with Assistant District Forester R. H. Evans, Supervisor Mattoon of the Pisgah and Korstian. Two portable mill operations on the Pisgah were visited.

Biological Studies

Mr. A. H. Howell, of the Biological Survey, arrived during the month to begin studies, in cooperation with the Station, of animal life in relation to the forest. Mr. Howell is now engaged in making an animal census of typical areas on the Bent Creek Experimental Forest.

Mr. Harold Heffley, a graduate student at Duke University, spent two weeks on the Experimental Forest getting material for his doctors thesis on the ecological relations of rodent parasites. Heffley's stay overlapped that of Mr. Howell and they worked in close cooperation. Every rodent captured served at least a dual purpose.

South Carolina Added to Appalachian Territory

Following the formal transfer of the responsibility for investigative work in South Carolina from the Southern Station to the Appalachian, Korstian met Demmon, Wyman, and Barrett of the Southern Station at Charleston on the 23rd and spent four days with them, visiting the Jackson National Forest, the Southern Railway's Demonstration Forest at Pregnall, and the light-burning experimental plots on the Carolina Fibre Company's holdings at Lanes. Frothingham joined the party one day. A number of valuable contacts were made and plans laid for work to be undertaken next fall.

Loblolly Pine Study.

MacKinney took the punch cards containing the loblolly pine strip survey and accelerated growth data to Washington. He reports that about 30 runs have already been made through the tabulating machine but that the work has not progressed far enough to justify definite conclusions.

Planting

On the Clingman's Peak planting area, near Mount Mitchell, Korstian and MacKinney added four chain-square plots, containing 100 trees each, to the 53 previously established. Two of the plots were of Japanese red pine, one of Japanese larch, and one of northern white cedar. In addition, 30 seed spots of red spruce were put in. About 1500 cottonwood seedlings, obtained for the Station in Illinois, by S. B. Detwiler, were set out at Bent Creek and in Sandy Bottoms on the Pisgah. Seed of native red spruce, southern balsam fir, and several exotics was sown in the Champion Fibre Company's nursery, and three small beds were put in at Bent Creek to test the Bent Creek valley as a possible nursery site.

Korstian made a trip to Davidson River on the Pisgah National Forest with Supervisor Mattoon to examine possible sites for a nursery to supply planting stock for the National Forests in this region. The Davidson River location offers a number of outstanding advantages,- a well-drained, rich loam adjacent to a good all-weather automobile road and near a good water supply which can be developed cheaply.

Forest Pathology

Nelson returned to the Station following a four-month's detail to Washington. While in Washington he cooperated with G. F. Gravatt

in preparing a manuscript on the tannin content of dead chestnut trees. A large number of cultures were made of oak-rotting fungi preliminary to a study of the identification of heart-rotting fungi of oaks. Detailed plans were prepared for two new studies: (1) the entrance of decay through fire scars in oak, and (2) the effect of blue stain fungi in the death of bark-beetle infested pines.

Forest Insect Studies

Early April was spent in getting together a progress report on the past season's work.

R. A. St. George spent the last half of April at the Station, where he and Beal started some experiments in treating logs to repel insect attack. Plots were also laid out in locust where treatments against the locust borer are to be tested out.

Dr. F. C. Craighead spent a few days at the Station going over plans for the summer's work with Beal and St. George.

Sufficient broods of the southern pine beetle were located with which to carry on experiments in 1928.

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ALLEGHENY FOREST EXPERIMENT STATION

General

The early part of the month was largely devoted to the formulation of the Station program. Forbes attended a conference held in Washington April 16-21, and there discussed with Assistant Forester Clapp, Munns, Frothingham and McCarthy the proposed lines of work, and further cooperation with the Central States Station on the oak study. The incorporation of various suggestions by the Branch and the approval of the projects outlined in the program marked a very definite step in the beginning of our first full season of field work. The first season's field work will be concentrated on the oak study, already mentioned; the development of our headquarters tract at Camp Ockanickon, through the preparation of a detailed inventory of what we have, and the formulation of a long-term program of experiments; and the expansion of our methods of cutting project in the Allegheny hardwoods to include a preliminary survey of the effect of cutting and fires on the various elements in the original forest, particularly white pine.

Junior Forester Schnur returned to the station after a very profitable two-months' detail in the office of Measurements. Mr. Dayton P. Kirkham and Mr. L. D. Lloyd joined the staff as temporary field assistants.

Forbes attended a forestry conference held at Pittsburg under the direction of the Pittsburg Chamber of Commerce, then going to Warren, where he has been directing and assisting in the Management study on the Allegheny Forest.

With visits to the Trenton State Library and the libraries of the New York and Brooklyn Botanical Gardens, Dr. Kelley completed his study of the accounts of the original forest conditions in this region.

Wood has practically completed the construction of fire lines for the protection of the headquarters forest tract at Camp Ockanickon. This construction consisted in "brushing-out" a three-quarter mile section of the old Rakestraw Road and clearing a 20-foot line for a distance of one-fourth mile. Tentative plans for erecting a small combined office and dwelling have been drawn up with the approval of the Y.M.C.A. committee, and it is hoped to get this under way in the near future. The building of this structure will insure cheaper and more satisfactory accommodations for the men working on the area than are available in the nearby towns.

Visitors

Mr. Arthur Koehler of the Biological Section spent one day, April 11, discussing cooperation of the Station with the Section in various fundamental lines of work. Dr. Jean Dufrenoy, a botanist in charge of the chestnut blight situation in France, visited several New Jersey and Pennsylvania forest areas in company with Dr. Kelley. The Chief Clerk of the Philippine Forest Service, Vincente Ramos, stopped over on his way north from Washington to study office procedure and methods, and to read available literature on the research organization in general.

Management

Hough met Kirkham in Warren on April 16, and although inclement weather has somewhat interfered with field work, they have made substantial progress in tagging, measuring and tallying the plots laid out earlier in the spring. A crown map of the stand after completion of the cutting and a reproduction count have been made.

Measurement

Schnur left on April 16 for Baltimore where he paid a visit to the State Forester's office and received valuable suggestions relative to growth studies in Maryland. On April 17 he joined Assistant Silviculturist Day of the Central States Station and started on the cooperative work to be done on the oak study in this territory. Directors McCarthy and Forbes stopped over at Principio Furnace on April 22 and discussed the work with Schnur and Day, giving them the benefit of the recent conference in Washington.

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SOUTHERN FOREST EXPERIMENT STATION

General

Naval stores extensive surveys in Florida, Georgia, and South Carolina, occupied the time of a large part of the staff during April. Demmon was out the entire month, while Wyman, Wahlenberg, Harper, and Barrett were with the party for shorter periods. Korstian, of the Appalachian Station, joined the party at Charleston, South Carolina, and several days were spent in that vicinity visiting the Camp Jackson National Forest near Columbia, the Lane's longleaf fire plots and the experimental plots of the Southern Railway at Pregnall. Later Frothingham joined the party for the purpose of talking over the transfer of the South Carolina work from the Southern to the Appalachian Station.

Heavy rains and subsequent flooding of streams made auto travel somewhat uncomfortable at times. On the day of Frothingham's visit the party started from Charleston for a point 40 miles away. After detouring all morning, noon found them still 35 miles from their objective.

The last week of April Wyman and Barrett concluded the naval stores surveys for the year. A number of operations were visited in south central Georgia and data taken in turpentined stands to determine the average type of work practiced in the region.

Dr. Gerry and Dr. Cary completed their stay at Starke and left during the early part of the month. Mr. Arthur Koehler of the Madison Laboratory spent one day looking over the naval stores work, and Mr. Roland Turner of the Southern Railway was also an interested visitor. Other visitors at Starke were R. E. Marsh of the Washington office, S. J. Hall of the James D. Lacey Company, Jacksonville, and S. B. Jennings and Simon Williams, members of the Florida State Board of Forestry.

A number of articles for American Forest Week were prepared, each member of the Station staff contributing at least one. Practically all of these articles have appeared as news items in various lumber trade papers and newspapers.

Protection, Fire

At Bogalusa, Wakeley completed laying out a series of nine plots in an 800-acre burn, for the purpose of studying the effect of fire on the longleaf needle blight (Cryptosporium acicolum) and also on longleaf reproduction as well. Two check plots were established on adjacent unburned areas. The experiment with fire control of needle blight will serve as a valuable check on the Urania experiment made several years ago. The 800-acre at Bogalusa which burned over in March of this year permitted of much better isolation of burned plots than was the case with the small burns at Urania.

While at Starke the extensive survey party ran several chains of strip survey through an area of slash pine at Sampson Lake to determine the effect of a peat fire which had burned during the period January -- March, 1928. This type of fire is of rather unusual occurrence in southern forests, but can be very destructive.

Management

Barrett completed his detail at Washington and reported satisfactory progress with the accelerated growth study of longleaf pine.

With Reinecke's help a field form was devised for recording thinning study data. This form is so arranged that the data for five successive measurements can be placed directly on punch cards.

At the Choctawhatchee branch, Gemmer completed tabulations of the seed tree descriptions of various permanent plots and also made maps of some 20 plots. Several establishment reports were also completed.

Naval Stores

By the end of April the French face and American split face tests at Starke had been given their fourth streak. There were five streaks on at the Union and Duke's tracts and seven at Sampson Lake and the Kingsley tracts. The gum on three tracts was dipped during April, one being dipped on four streaks, one on five, and one on six streak

Progress was made on individual tree descriptions and height measurements. It is planned to make a complete description of every tree on each of the experimental areas at Starke.

An experiment to test the effect of fertilization on gum flow was established on the Kingsley tract. A total of 28 slash pines were treated, four groups of seven trees each being treated with different kinds of commercial fertilizers. Yielding capacities of these trees have already been established. The kinds of fertilizer used were muriate of potash, acid phosphate, phosphate screenings, and sulphate of ammonia. Twenty-five pounds of fertilizer were applied to each tree and in June a second application will be made.

Harper gave a talk at Gainesville on April 21 before the Florida Section of the American Chemical Society. The main subject discussed was tung oil, and naval stores came in for comment since it is used with tung oil in the manufacture of "spar" varnishes.

Wakeley and Hills dipped and weighed the gum on the 166 second-growth slash pines comprising the naval stores experiment at Kiln, Mississippi.

Forestation

At the Choctawhatchee branch, Gemmer commenced the recount of the longleaf plantations.

Wakeley and Hills spent a considerable part of the month on plantation reexaminations at Bogalusa, finishing all reexaminations for this season.

Protection, Others

Disease. In cooperation with the Great Southern Lumber Company and Dr. Hartley of the Bureau of Plant Industry, Wakeley established 24 mil-acre plots for the study of the control of longleaf needle blight by spraying. It is proposed that biweekly Bordeaux sprayings be tested out. Experiments will also be made with a lime-sulphur spray.

Insects. Gemmer began a series of ant poisoning experiments. Fifty seed spots in each of three cover types were laid out and treated with two kinds of poison bait. One is a brew of sugar, honey, and thallium sulphate, and the other is sodium arsenate.

Hardwood Investigations

Lentz and Putnam spent the entire month in the field carrying on hardwood investigations, largely in the Black River region of north Louisiana. Among other things they visited a 100-year old mill set at Natchez and also spent some time at the very efficient Fisher Lumber Corporation plant and woods operations.

In one instance they were able to check up on the fire damage occurring in mature hardwood timber. In a stand which had been burned during the drought year of 1924, 90 per cent of the trees were severely injured and in certain areas 50 per cent of the mature timber had been killed outright.

CALIFORNIA FOREST EXPERIMENT STATION

General

The Advisory Council held its first meeting April 16. President Ray Lyman Wilbur, of Stanford University, was selected as Chairman and Professor Walter Mulford as Vice-Chairman.

The present program of the Station, as presented, was tentatively approved on the understanding that as funds increase the work will be increased in the directions where it is known to be inadequate. The most important points for this extension to be applied were agreed to be, in the order of importance:

1. (The economic study
   (Forest influences
   (Fire studies

2. Work in the redwood region

3. Grazing studies

The functions of the Council were set up tentatively as follows:

1. To advise the Forester and the Secretary of Agriculture in respect to forest research work of the California region, particularly as affecting the California Station.

2. To stimulate a close correlation of research work between the Station and other agencies in this region.

3. To assist the Station in public education and the dissemination of the Station's research results.

A publicity committee was appointed by the President to give out approved information and to create a public interest in forest research. A motion was passed unanimously that the state, counties, and cities be solicitated to furnish financial cooperation in the research work of the Station

Management

Growth Predications. Riley's detail from the Modoc was prolonged until April 15 to allow further progress in the assemblage of growth prediction data for management plan use. Curves were drawn from sample plot records showing the percentage of trees in each crown class by 2-inch diameter classes, for the several species and for site-type groups. Casual inspection of the curves discloses no obvious relation with site class or compositions. Incense cedar appears to be the only species justifying an individual curve. Further analysis of the curves will be necessary before tables can be prepared. The check of the height and diameter prediction curves against actual measurements of growth for a 15-year period shows the predicted and actual growth curves to be reasonably close.

During the last ten days of April the study of roots was resumed on the Stanislaus by Dunning and Clements. Competition between the roots of mature seed trees and reproduction was studied by radiating transects from a large tree through sectors without seedlings, with seedlings weakly developed and with seedlings in a healthy vigorous condition. The pumps were only available for a few days, so only certain preliminary facts were brought out. Where seedlings were absent or badly suppressed, exceedingly severe root competition was found more than 50 feet from the large tree. The large conducting roots of the old tree form a close net-work at 12 to 15 inches from the surface. From these large roots small branches ascend with feeding tips within one inch of the surface. Such rootlets are in competition with even the smallest annual herbs. Many perennial herbs have roots descending considerably deeper than the main mass of the tree roots. A tree seedling during the first season comes directly into competition with the roots of the reserved seed trees. Root growth had begun by April 20, although no sign of stem growth could be found. Frosts occurred every night, but there was no freezing of the ground beneath the litter.

Cover Type

The cover type of the Angeles National Forest was completed. A total area of 1450 square miles was mapped. Seven hundred 1/10-acre sample plots were mapped, representing the principal types in which detailed notes as to composition, height density, and penetrability of vegetation and depth of litter and humus were made. This material will serve the purpose of checking the proper zoning of the types and also in connection with the relative fire hazard survey of types for use of the Administrative Organization.

Forestation

Siggins has started the first outplanting experiments undertaken by the Station. With stock raised at Feather River and at the Eddy Tree Breeding Station, plantings were made on recently burned over areas on the Plumas and on a completely denuded area on the Stanislaus. The latter experiments were in cooperation with the Pickering Lumber Company, who paid the total costs of the experiment. Some 7,000 western yellow pine 2-0 seedlings were planted on badly torn up areas where high-lead logging had been practiced to the nth degree. The objects of the plantings on the burned and the denuded areas are to test whether higher survival may be expected where root competition from competing vegetation is removed.

Products

Heptane. A cooperative agreement has been reached between the Station and the Bureau of Entomology which will permit the continuance of the heptane experimental work on our small funds by the Bureau undertaking part of the salary expense in return for Tihomiroff carrying on for them some chemical studies in respect to the basis of attraction of particular tree species for the species of Dendroctonus peculiar to them. Most interesting results have followed the graphing of 1927 heptane climatic temperature curves upon a basis of the physiologic heat constant.

Blue Stained Box Shook. Kerosene oil box shook which blue stained so badly after manufacture as to discolor and besmudge the labels on the cans packed in it throughout a considerable consignment have caused so sudden a desire for better practice on the part of one of the large oil producing companies that they have assigned a promising young engineer to the problem until he gets the answer, both of better drying and better design of thin packages. Unfortunately, the day that he first called on the Products office was

the day on which the April box course at the Laboratory began. But they will in all probability send him to the next course which is given, and he will go armed with samples and all details of their practice and troubles.

White Fir. The report on our long drawn out and much interrupted study of the manufacturing practices, marketing, and uses of white fir in California has at last been completed. Our conclusions are as follows:

1. White fir is now an unprofitable species in California because of the competition of low priced Douglas fir from the Northwest.

2. The loss to the lumberman is greater than it should be and the demand is much less than it should be chiefly because of poor seasoning practice.

3. The producer can reduce losses and greatly decrease prejudice by being reasonably careful in his handling of white fir. (In the past, handling has been inexcusably careless.)

4. The local office of Products may be able to help by interesting the lumbermen in helping themselves, by cooperating in studies of various phases of production, and by bringing white fir to the attention of lumber users.

5. The Madison Laboratory could help materially through immediate, wide distribution of a circular or bulletin on white fir and by further studies of uses, methods of handling, and preservation. The greater use of white fir in larger timber sizes deserves special consideration.

6. A special study of paper pulp possibilities is needed.

7. The District Office of Forest Management would be justified in reducing Government losses on white fir stumpage in future timber sales by the use in appraisals of an efficiency correction factor based on the results of this study.

Entomology

Most of April was spent in completing the preliminary draft of the report on the importance of the clerid Thanasimus nigriventris Lec. and other beneficial insects in the control of the western pine bark beetle. This report deals principally with the clerid and includes its life history, habits, and effectiveness in the natural control of the western pine beetle. It also shows how the destruction

of these predators during control operations can be reduced by treating only the winter generation trees and by protecting the bases of the trees from the control fires.

It was found that the clerids were two or three times as abundant on the first generation (summer) trees as on the over-wintering trees. As many as 50 clerids were found in one square foot of bark on a first generation tree while one tree averaged 30 clerids per square foot for the entire infested part of the stem. It was also found that from 40 to 90 per cent of the clerids migrated to the base of the trees before pupating.

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PACIFIC NORTHWEST FOREST EXPERIMENT STATION

All members of the organization spent more or less time during April in the field, but snow down to quite low altitudes and incessant cold rains have made conditions unfavorable and have delayed the growing season.

Douglas Fir Slash Disposal Problem

At the request of Major Cowan of the Washington Forest Fire Association, Munger spent a couple days on the Olympic Peninsula with him discussing whether or not certain areas of slash on big private logging operations should be burned. It was decided in these instances burning was essential from a protection point of view regardless of its silvicultural aspects, and accordingly the State will insist upon this being done.

A New Case of Industrial Forestry

While on the Olympic, Munger quite unexpectedly encountered the beginnings of a new industrial forestry development by the Washington Pulp and Paper Company. This spring that company has sowed to Sitka spruce 115 acres of agricultural land following plowing and discing. They also planted 90 acres of logged-off land to wild Sitka spruce seedlings and have started a 30-bed nursery. The work is in charge of a former Forest Service ranger with an ex-Forest Service technical man as nurseryman. The company was "sold" on the wisdom

of growing spruce after cutting and putting through the pulp mill a small patch of 40-year-old Sitka spruce that yielded at the rate of 130 cords per acre.

O. A. C. Forestry Boys at Wind River

Twenty-seven juniors and seniors from the O.A.C. Forest School made their annual pilgrimage to Wind River with Professor Starker. Munger joined them there and devoted more than a half day to showing and telling them of the Experiment Station work.

American Forest Week Activities

The Experiment Station had a large share in arranging table decorations for the big meeting at the Portland Chamber of Commerce when the Premier of British Columbia spoke on forest conservation. These decorations consisted of a large number of properly labeled boxes of small trees from the government and industrial forest nurseries, and sections of a 37-year old second-growth tree from logged-off land, with appropriate literature at each place. During this week also, Munger addressed the Centralia, Washington, Rotary Club.

Portland Municipal Arboretum

Those in dendrology may be interested to know that the Portland City Club has set aside a piece of park property of eighty or a hundred acres for development as an arboretum. It is admirably situated for this purpose, and will probably be in time a very interesting museum of living conifers.

The Use of Fusees in Firefighting

The experience of several different cooperators and of the Forest Service with the railway signal fusees as back-firing torches has been embodied in a short memorandum by Mr. Simson, mimeographed and sent to forest protectionists, inside and outside the Service.

Spacing Test Plantations

When at Wind River, Isaac replaced the dead trees (for the third time) to keep these plantations up to the exact spacing. It is interesting to note that apparently the recent failures have occurred where

other trees have died before, suggesting that there is something in the soil. It may be correlated with the severely burned spots where stumps were burned out in the repeated fires that scourged this area.

Regional Races of Western Yellow Pine

The completion of these test plantations of various strains of western yellow pine referred to in last month's report took some of both Isaac's and Westveld's time on the Columbia and Whitman Forests, respectively.

Wind River Doings

Simson left the office for the Wind River Branch April 15, somewhat later than he usually leaves but the spring is both late and wet.

A valuable contribution to the Wind River Arboretum was received from the Eddy Tree Breeding Station, consisting of twenty-three lots of pine seed of as many species - some of them quite rare.

Permanent Growth Plots in Fog Belt

Mensurational field work made its start for the season when Meyer assisted by Corp of the District Office went into the "Fog Belt" of Oregon and established two permanent sample plots in practically pure western hemlock on lands of the Crown Willamette Paper Company. These were the first permanent plots ever laid out by the Forest Service on private lands in District 6. In addition to the two permanent plots, five temporary plots were measured up for supplementary information. The tallies were worked up in a tentative manner and gave some very interesting results, as can be seen in the accompanying table. The volume values are not final since the tables were not altogether satisfactory. They are surprisingly large and indicate very well the excellent growth possibilities of this region.

Summary Sheet for Hemlock-spruce Sample Plots

Av. Age	Values per acre: No. of trees: Hemlock	Spruce	Total	No. trees 10"	Total Basal Area	Av. D.B.H.	Av. Hgt.	Volume: Scribner	Cu. ft. inc. bark
yrs.					sq.ft.	in.	ft.	bd.ft.	cu.ft.
79	108	6	114	101	292	21.7	132	80,600	16,390
100	186	-	166	119	282	17.6	118	68,600	15,320
67	49	80	129	108	266	19.5	138	79,200	16,600
70	135	8	143	130	293	19.4	138	91,000	18,600
78	162	14	176	136	298	17.6	131	84,100	18,270
80	230	-	230	176	303	15.6	128	81,700	19,120
80	230	6	236	201	350	16.5	132	99,500	21,000

Working Plan for Western Yellow Pine Yield Study

Meyer drew up the working plan for the western yellow pine growth and yield study. The plan must aim to cover not only National Forest practices in cutting and their consequent effect upon the growth of the remaining stand, but also private practice which often differs quite radically. Methods of cutting now in vogue may result either in even-aged stands or in all grades of selection stands. A full plan should therefore cover even-aged stands as well as selection stands. The individual tree will undoubtedly be a much more prominent factor than in previous yield studies. Its ability to remain standing, its response to release, the relative differences of growth in the various portions of the stem are all of primary interest

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NORTHERN ROCKY MOUNTAIN FOREST EXPERIMENT STATION

Early in April all the meteorological equipment at Priest River was inspected and conditioned by Gisborne, and the automatic instruments put in operation. The full schedule of measurements of both weather and fuel conditions will not be commenced, however, until June 1, when a temporary assistant will be assigned to the work. The single series of fuel-moisture measurements made in April showed more moisture in 2-inch slash and the outer surface of down timber than was present at the same time last year. Under such conditions, and with the weather that has occurred since then, a repetition of the early fire season of 1924 does not seem probable this year.

In order to check the applicability in northern Idaho of Isaac's tests of seed dispersal, the prevalent wind velocities occurring during the period of dispersal have been computed for an anemometer 80 to 150 feet above the ground at the Priest River Station. For western white pine, the species of greatest interest to us, work to date indicates that the bulk of the dissemination occurs during September and October. An analysis of the Priest River wind records from 1915 to 1927 indicates that there are 1397½ hours in September and October during which the wind blows at a velocity of 1 to 5 miles an hour, 61 hours at 6 to 10 miles an hour, 5½ hours at 11 to 15 miles, and ¼ hour at 16 to 20 miles.

From this it appears that since winds of 11 miles per hour or more only occur about 5½ hours in any year during the period of white pine seed dispersal, such velocities are only of minor importance. This generalization is, of course, subject to amendment, since it is just possible that a larger share of the seed may be disseminated during the 5½ hours of high wind than during the remaining 1458½ hours when the velocity is 10 miles or less. A further study should be made to determine the relation between wind velocity and amount of natural dispersal.

An interesting comparison is found between Isaac's figures for dispersal after releasing white pine seed from a kite 150 feet above the ground in an eight-mile wind, and Brewster's empirical examination of reproduction on burns and cut-over areas.

Distance Feet	Percentage Found Within Given Distances	
	White Pine Seed Isaac's Experiment	White Pine Reproduction Brewster's Examination
200	30	40
400	53	63
600	77	77
800	85	88
1000	87	95
1200	90	99

Dr. Little of the Physics Department of Montana University, with the assistance of Marshall, recalibrated our thermo-electric pyrometer during the month. The method used was to immerse the thermo-couples in solids of a known melting or boiling temperature, and then to observe how much the pyrometer readings varied from the true ones at these points. In all cases the pyrometer ran low: 15° C. at the boiling point of water, and 77° C. at the melting point of potassium iodide (680°). One test also was made with sodium nitrate which melts at 308° C. A correction curve was drawn up from the figures obtained, and will be applied to all readings. These

departures were not expected, because the pyrometer was supposed to have been accurately calibrated by the factory less than a year ago.

Junior Forester Bowman, loaned to the Station by the District Office, has been doing computing work for us all month, principally on data gathered last summer on the reproduction study. The results obtained seem to indicate a distinct correlation between percentage of the butt of white pine scorched, and tree vigor one year later. A slight relationship appeared to exist between height of burn and vigor, but there was no correlation at all between severity of burn in August 1936, and the following year's cone crop.

One of the sample plots furnished an excellent opportunity to compare the relative fire resistance of the different conifers of the western white pine type, since every species indigenous to that type, except yellow pine, was found on the area. The percentage of mortality by species fifteen months after the fire is shown below:

Western larch	2
Douglas fir	19
Lowland white fir	45
Lodgepole pine	50
Western white pine	60
Western red cedar	73
Engelmann spruce	75
Western hemlock	78
Alpine fir	94

It is interesting to note that this rating checks without single deviation a theoretical one published by Flint in 1925 in the Idaho Forester. Flint based his rating on thickness of bark, root habit, resin content of bark, branching habit, stand density, inflammability of foliage, and lichen growth.

The phenology project was started during the last week of April with 26 observation stations on National Forests, one at Savenac Nursery, one at the Priest River Branch, one in Yellowstone National Park, and three at educational institutions. The stations were selected to represent conditions in the white pine, yellow pine, larch-fir, and lodgepole pine types. Observations are to be taken weekly throughout the growing season and are to be continued on the same group of trees and subordinate vegetation for a number of years. After an observation station is selected, the work should not take more than an hour or two a week. In selecting observers from among forest officers, a special effort was made to pick men with at least a good amateur knowledge of botany and with a known interest for this sort of thing. From our experience years ago, and from experience elsewhere,

the necessity was keenly realized, in starting the present observations, of having observers who will show some personal interest in the work and will not perform it in an incomplete or perfunctory manner.

Marshall compiled some of his pH measurements made last year into a short article, "Soil Alkalinity on Recent Burns," which was submitted to Ecology. Gisborne also wrote a short explanation of the new fire-behavior sample-plot report form, which was sent to the Journal of Forestry under the title "The Complicated Controls of Fire Behavior."

The annual D-1 ranger training school was held at the Priest River Branch Station during the entire month of April. W. W. White, Assistant Chief of Management, and J. B. Taylor, Supervisor of the Deerlodge Forest, were in charge. Although the Experiment Station staff assists only slightly in this work, with a few lectures and demonstrations by Kempff and Gisborne, the new rangers are shown around the demonstration forest and become more than casually acquainted with the work of the Station.

From May 21 to 26 a Supervisors' fire conference is to be held at the Priest River Branch, and from May 28 to June 6 the junior and senior forestry classes of the University of Idaho will be there for instruction. Both Weidman and Gisborne will attend part or all of the Supervisors' conference, and the entire station staff will be on hand to conduct the establishment of permanent sample plots and other work by the Idaho students. Such meetings are proving of considerable value in cultivating personal knowledge of our research work without resorting to pure propaganda.

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SOUTHWESTERN FOREST EXPERIMENT STATION

The ninth annual meeting of the Southwestern Division of the American Association for the Advancement of Science was held in Flagstaff from April 23 to 26. The meeting was well attended; about sixty members being present. An interesting and comprehensive program was presented in which forestry and forest research took a prominent part.

At Monday's luncheon, Assistant District Forester Quincy Randles presided as chairman for the American Forest Week Program. Short talks were given by District Forester Frank C. W. Pooler, Quincy Randles, and Herman Krauch.

At the meeting of the Biological Section on Wednesday morning papers were presented by Quincy Randles, Bert Lexen and Herman Krauch of the Forest Service and by Dr. W. P. Taylor of the Biological Survey. On Wednesday afternoon the members of the Biological Section were taken on a trip to the Southwestern Forest Experiment Station and vicinity where the work in the forest and grazing research was shown and explained by Cooperrider and Krauch.

The tenth annual meeting of the Southwestern Division of the Association will be held in Albuquerque next April.

ROCKY MOUNTAIN FOREST EXPERIMENT STATION

April Activities

During the first part of the month Roeser compiled the field data of the Jack pine thinning study on the Nebraska and prepared a progress report in which results are made available for the guidance of the Supervisor in subsequent thinnings of plantations of this species. Six plots, in two blocks, are included in the experiment. The trees were planted in 1910 and 1911, and were spaced so that the stand averaged between 2300 and 3100 per acre. Thinning was accomplished in the fall of 1920 on two plots and in the spring of 1923 on the others. Considering both the factor of growth, which varies directly as the space between trees is increased by thinning, and the factor of soil protection and precaution against early losses, the data indicate that a spacing which leaves about 900 trees per acre ten years after planting appears desirable.

Roeser moved to the Fremont Field Station and started the season's field work. His first job was to make some very necessary changes in and additions to the 14 meteorological stations of the type study to prepare these for the coming field season. About 200 2-3 transplants representing 18 different vigor lots of lodgepole pine in the seed-source study, were field planted and also 100 2-2 trees (50 each) from seed of two Douglas fir parent trees, one of which was selected because it represents a desirable strain, and the other because it is extremely undesirable from the standpoint of a timber producing type. The growth of the small trees will be watched with interest to see if the apparent superiority both in quality and survival of the progeny from the desirable tree is retained as the trees grow older.

The 2-0 stock from two western yellow pines and six Douglas fir trees designated for breeding study purposes was transplanted in the local nursery at the end of the month.

Mr. P. B. Lister, range examiner, visited the Station to investigate the prospect of cooperation in procuring observations on grass growth in connection with the regular type study observations which constitute one of the regular activities at the Station. He was struck with the similarity of experimental interests between silvicultural and grazing research and the possibilities for correlation between the two branches.

May Plans

The testing of seed received from various forests in the Douglas fir and Engelmann spruce seed production studies, started in April, will be continued through May. Also periodic field observations will be made of the local plots and trees in the experiments involving the amount and periodicity of seed production and the relation of flower formation to cone production of western yellow pine, Douglas fir, and Engelmann spruce. These observations are in the line of phenological studies, since one of the purposes of these experiments is to correlate flower and cone production and climatic conditions.

The seed collected last fall from the numerous western yellow pine trees involved in the breeding study will be sown at the Monument Nursery in order to take advantage both of improved nursery conditions and of technical assistance in carrying out the study.

During the balance of the month improvement and maintenance work will be pushed at Fremont, and it is possible that a start will be made in laying out the 1928 quota of cutting plots in the management study of the Station Forest.

MANUSCRIPTS

Pacific Northwest

Viability of Douglas Fir Seed Stored in Duff, Leo A. Isaac. (Progress Report)

Wind River Thinning Studies, Leo A. Isaac. (Progress Report)

Lake States

The Natural Reproduction of Lodgepole Pine on Experimental Cutting Areas in the Central Rocky Mountains. C. G. Bates.

Central States

Seasonal Variations in the Physical and Chemical Properties of the Leaves of the Pitch Pine with Especial Reference to Forest Resistance. B. S. Meyer.

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IN PRINT

Bates, C. G. and Roeser, J. Light intensities required for growth of coniferous seedlings. (American Journal of Botany, March, 1928.)

Bruce, Donald. Establishing a company forest policy. (Paper Mill and Wood Pulp News, March 17, 1928).

Forbes, R. D. The Nordic philosophy invades forestry. (Journal of Forestry, April, 1928).

Gemmer, E. W. Facts about the root system of a longleaf pine. (Naval Stores Review, April 21, 1928)

Harper, V. S. Small trees make more scrape than big trees. (Naval Stores Review, April 21, 1928)

McCarthy, E. F. Regeneration for pulp. (Proceedings of Woodlands Section, Canadian Pulp and Paper Ass'n, January, 1928)

Meyer, W. H. Rate of Growth of Immature Douglas Fir as shown by periodic remeasurements on permanent sample plots. (Jour. Agr. Res. Feb. 1, 1928)

Stickel, P. W. Comparative forest fire hazard in the northeast. (Jour. of For. April, 1928).

Wakeley, P. C. Longleaf pine reproduction in the South, (Naval Stores Review, April 14, 1928)

Zon, R. Are foresters biologists or economists? (Jour. of For. March, 1928)

" " Forest conditions in Wisconsin. (American Lumberman, March 31, 1928)

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Lumber Manufacturing Costs in the Inland Empire for 1927 Show Slight Increase Over Those of 1926

During the latter part of March and the first of April Mr. Bradner, assisted by Mr. Neff, D-1 Logging Engineer, made the annual manufacturing cost collection trip. Detailed cost data were obtained from 33 Inland Empire band sawmills. The total amount of lumber cut by these mills in 1927 aggregated 1,134,900 M feet. The amount shipped was 1,136,337 M feet. These statistics, which are collected annually, furnish accurate cost data for use in District appraisal work and lumbering studies.

In the table which follows, the 1926 and 1927 manufacturing costs are compared in detail. The total cost per M feet in 1927 was $11.18 as compared with $11.08 for 1926. The pond-to-car cost per M for the two years is practically identical. The overhead charge, which includes general expense, taxes, and depreciation, was nine cents more per M in 1927 than in 1926. Pond-to-pile costs are prorated on the basis of the M feet cut, while pile-to-car costs are prorated on the basis of the M feet shipped. Overhead costs are prorated on a basis of one-half cut and one-half shipment. Interest and discount are not included in the cost of manufacture.

ø Detailed Comparison of Lumber Manufacturing Costs (per M') for Years 1926 and 1927.

Charge	1926	1927	Charge	1926	1927
	$	$		$	$
Pond	.14	.13	Pond		
Sawmill	2.26	2.23	to	4.00	4.00
Yarding	1.60	1.64	Pile		
Shipping	3.14	3.14	Pile to	4.36	4.37
Selling	1.22	1.23	Car		
General Expense	1.59	1.64			
Taxes	.39	.42	Overhead	2.72	2.81
Depreciation	.74	.75			
Total Cost	$11.08	$11.18	Total,	$11.08	$11.18

ø Based on actual costs collected from 33 Inland Empire band sawmills. Cut 1926 - 1,093,370 M feet B.M. Cut 1927 - 1,134,900 M feet B.M.

In Table #2, which follows, the 1927 costs have been grouped by mills classified as cutting a majority of a certain species or product. The cost of the manufacture of western (Idaho) white pine and its associate species into lumber is considerably higher per M feet than for western yellow (Pondosa) pine, or larch and Douglas fir. The western white pine products demand a higher price than do those of western yellow pine, and more refined methods of manufacture are, therefore, considered profitable. The type of sawmill equipment and the character of the product cut are practically the same in both groups of pine mills. Approximately 7% of the larch and Douglas fir are ordinarily cut into dimension timbers and ties, and where the cut is made up principally of these species the cost of manufacture, particularly in the sawmill, is considerably lower than for the pines. Due to the low value of the larch-fir products, less refined methods of manufacture are employed throughout the process.

Tabel #2

Detailed Lumber Manufacturing Costs (per M Feet) - 1927 ø

Charge	Idaho White Pine Mills (1)	Pondosa Pine Mills (2)	Larch-D.Fir Mills (3)	Tie, Match Plank, etc., Mills (4)
Pond	$ .13	$ .10	$ .15	$ .13
Sawmill	2.22	2.24	1.85	1.91
Yarding	1.54	1.52	1.73	1.01
Shipping	3.50	3.07	2.54	.25
Selling	1.56	1.17	.90	.18
General Expense	1.79	1.72	.83	1.03
Taxes	.49	.33	.39	.42
Depreciation	.77	.71	.54	.61
Total	$ 12.00	$ 10.86	$ 8.93	$ 5.54

ø Based on actual costs collected from 33 Inland Empire band mills. Cut, 1927 - 1,134,900 M feet B.M.

(1) Mills cutting 50% or more western white pine, Engelman spruce, white fir and cedar, combined.

(2) Mills cutting 50% or more western yellow pine.

(3) Mills cutting 50% or more larch and Douglas fir, combined.

(4) Mills cutting principally ties, timbers, and match plank.

Preliminary Work on Wood Waste Survey in Logging, Under Way

Several field trips have been made into the white pine cuttings of North Idaho and the western yellow pine logging areas of Western Montana by Mr. I. V. Anderson, in connection with the wood-waste survey which is being initiated this spring. The necessary forms to be used in collecting the field data have been worked out and a plan of work decided upon.

Objectives of the study may be enumerated as follows:

(1) To secure accurate figures on the volume of unutilized wood left after logging, disregarding all economic factors.

(2) To secure accurate data on the volume of unutilized wood left after logging that could be economically removed at the present time.

(3) To serve as a basis for determining the specific wood-waste problems in logging, both quantitative and qualitative.

(4) To determine feasibility of correlation of allied forest industries, such as charcoal burning, pulp manufacture, etc., with lumber manufacture.

(5) To determine accurately the cull per cent on certain Forest Service areas.

(6) To secure data that can be used as a basis of comparison between utilization on individual operations.

(7) To secure information enabling a comparison between the different variable factors in logging. Some of the variables to be considered are: 1. Railroading vs. sleigh haul and driving. 2. Summer vs. winter logging. 3. Long haul vs. short haul. 4. Steep country vs. level or rolling chance, etc.

The work during the early spring and summer will be concentrated on the wood-waste-survey part of the project. Studies on specific wood-waste problems will be made as the work progresses. Among the studies which indicate possibilities for improved utilization may be listed log buck for grade, loss from breakage in gravity chuting and felling, loss of footage in stump heights, together with practicable means of reducing such losses.

Census

Returns have been received from about 80 per cent of the establishments in Idaho and Montana. The clean-up work has been started and it is expected that all delinquents will be accounted for during the next three or four weeks.

Production reports from the large mills cutting 5,000 M or more in 1927 indicate very little increase or decrease in the combined cut of the two States as compared with the preceding year.

The following comparison is based on the output of identical mills which contributed 82.4 per cent of the total cut reported in 1926.

State	No. of Mills	Lumber Cut (M feet board measure) 1927	1926
Montana	10	328,544	307,195
Idaho	24	762,146	786,157
Totals	34	1,090,690	1,093,352

Reports

The Retail Lumber Price report for the first quarter, 1928, was completed during the month by Mrs. Bullard. This report covered 28 representative dealers in this region.

The latter part of April was spent in compiling the Mill Lumber Price report which is compiled quarterly from data furnished by the Western Pine Manufacturers Association.

Lumber Prices

Av. Mill-Run Prices	Annual 1926	Annual 1927	January 1928	February 1928	March 1928
Idaho White Pine	$ 37.77	$ 35.85	$ 30.17	$ 30.78	$ 29.64
Pondosa Pine	26.33	25.17	24.19	24.71	25.07
D. Fir and Larch	17.78	18.19	16.38	16.68	16.60
White Fir	19.10	17.41	16.80	18.01	19.37
Spruce	23.73	23.39	25.67	24.86	22.93

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Mr. Gibbons presided at the wood pulp and paper industry symposium of the Pacific Northwest Regional Meeting of the American Chemical Society, held at Reed College, Portland, April 6 and 7, under the auspices of the Oregon Section and Reed College. Mr. Gibbons also read a paper, "Volume and Suitability of Pacific Coast Pulpwoods." Other speakers included Mr. Hodgson, Mr. Vance Edwards who substituted for Mr. B. T. McBain, and Dr. H. K. Benson, Head of the Department of Chemical Engineering, University of Washington.

Mr. Hodgson's paper, "Paper Pulp from Logging Waste in the Douglas Fir Region" dealt with a few of the more general phases of our current study, at the same time stressing the great amount of material suitable for paper pulp which is now being left in the woods.

General Wood-Waste Survey in the Douglas Fir Region

Mr. Hodgson devoted the month to computation and tabulation of results of the field study, working with the relationship of factors as they affect utilization in the woods.

As mentioned last month, the data have shown a wide variation in utilization by independent loggers and logger-manufacturers. The tabulations prepared during April show that the soundness of timber is an important factor in utilization. The figures on this point bring out that:

Logger-manufacturers logging sound timber are leaving on the average 14.5% in volume of the original timber stand as waste; when logging defective timber they are leaving 31.9%. Independent loggers operating in sound timber are leaving 22.1% in volume of the original stand and when working in defective timber they are leaving 24.8 per cent.

The tables also show that logger-manufacturers logging on smooth ground are leaving as waste 14.5 per cent in volume of the original stand, but on broken ground the amount of waste becomes 21.6 per cent.

Census

Mr. Ira J. Mason, Technical Assistant, detailed to Forest Products from the Snoqualmie to assist in collecting the 1927 lumber, lath, shingle, cooperage and veneer cut of Oregon and Washington, completed his detail to Portland. This covered over two months, during which time he had practically entire control of the census work. He handled the job in fine shape.

Of the 2,016 listed companies, 1948 have been taken care of to date, 68 companies remaining to be heard from. A total of 1293 schedules have been sent to Washington, including 352 in April.

Little-Used Species

During the census trip in Washington Mr. Johnson was able to secure some additional information relative to the utilization of bigleaf maple. In 1927 approximately 2½ million feet was consumed locally, principally by the furniture industry; about 500,000 feet was shipped into California and 100,000 feet to the Middle West.

During 1927 there was considerable activity in the shipping of bigleaf maple burls to the Atlantic Coast. These burls were sold f.o.b. or f.a.s. shipping point at from 4 to 6 cents per pound, exceptional burls bringing a higher price; they weigh from 300 to 800 pounds. Burls weighing as much as two tons have been shipped. These burls are cut into 1/28-inch veneer which is used for overlays and inlays by the furniture industry. One plant at Kelso, Washington, specializes in the cutting of veneer from maple burls, receiving as high as $450 per 1,000 square feet.

Mill-Utilization Study

The general compilation of the data secured in the western yellow pine mill-scale study at the plant of the Mt. Emily Lumber Company, LaGrande, Oregon, is well along toward completion. Definite information as to overrun secured in this study for sound logs of different diameters and lengths will be available shortly.

Felling and Bucking in the Douglas Fir Region

Mr. Spelman is now in the field in connection with this study, largely for the purpose of checking the working plan which is now well toward completion.

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FOREST ECONOMICS

West Virginia Land Utilization Survey

This study has arisen out of recognition of the fact that research in land economics involves cooperative action by foresters and other land specialists as well as by agricultural economists in order to cover adequately all phases of balanced land utilization. The use of marginal and sub-marginal agricultural and idle lands for the growing of forest products, and the retention of areas now forested for continuous, permanent use as such has been seen by economists as an alternative to other uses.

The problem from the forester's angle is to decide which of the poorer lands are silviculturally suitable for the growing of forest products, and to determine for the lands selected those policies of development and management which will best serve the economic and sociological interests of the region. In other words, his work involves more than a mere inventory taking of the forest resources. He must go farther and apply his findings to the formulation of specific recommendations.

Among the numerous indications of the growing appreciation of the need for comprehensive land utilization planning with forestry as one of the important uses might be mentioned the Michigan land economic survey, which has been under way for several years, and has now covered a number of counties. The soil aspects of the problem are featured in this survey. As another the State of Wisconsin is undertaking a somewhat similar survey in certain counties, and Marinette County in that State is planning a study of its own with a view to more effective segregation of true forest lands for management as such. In New York the College of Agriculture and the State are working on a land classification problem and have already purchased a number of worn-out farms for the purpose of forest development.

Federal agencies, both in Canada and the United States, are recognizing the need for this sort of work. In Canada the Ontario Forestry Act of 1927 authorizes the Minister of Lands and Forests to acquire settled lands by expropriation and purchase for forestry purposes, and to cooperate with private owners in managing lands already forested. The Bureau of Agricultural Economics of the U. S. Department of Agriculture has instituted a series of extensive studies in regions adapted to farming and forestry, in order to clarify the problem of proper land use. The first study began last spring in Colorado in cooperation with the Colorado Agricultural Experiment Station. Others are under way or contemplated in Pennsylvania and other States. One was undertaken in

1927 in West Virginia, in cooperation between the Bureau of Agricultural Economics and the Forest Service representing the Federal Government, and the West Virginia Agricultural Experiment Station and College of Agriculture representing the State.

The project in southeastern West Virginia, dealing as it does with a region obviously marginal in character for agricultural purposes, involves the forestry aspects of the problem to a high degree. In brief, the purpose of this study is to construct for the territory covered a problem of land utilization based on a thorough study of the existing physical conditions and economic factors. The funds enabling the three cooperating organizations to carry on this project have been appropriated from several sources; namely, the Agricultural Appropriation Act for the current fiscal year, the Purnell Act which provides for cooperative research in agricultural economics, and the money allotted to research in forest economics.

The field investigations were made by representatives of the agencies concerned, Messrs. Peck and Cotton hailing from the Bureau of Agricultural Economics, and Messrs. Lee, Skuce and Wood representing the West Virginia College of Agriculture; the forestry end was supported by Frank of this office and Wood, assisted by Skuce, under supervision of Mr. Sparhawk who drew up the plan of work.

Both physical and economic data were obtained, the object being first to get a panoramic picture of the present forest conditions as affected by past treatment such as logging, fire and disease, and second, to differentiate between good and poor forest land, and for the former to determine the feasibility of management by private owners.

Half acre sample plots, and occasional strips, were run on various soils and cover types at different elevations in order to get the information on composition, growth and conditions of the forest cover. Composition was obtained by crown classes as well as by size and species, borings were made to cover the last twenty year period of growth, and note was taken of the forest floor and undergrowth.

The character of ownership, size of holdings, and the policies and intentions of the owners were investigated. Land and stumpage values were obtained wherever possible. In covering the condition of the existing forest industries attention was given to methods and costs of production, transportation and marketing. This was accomplished by means of a sawmill schedule which the field man presented to the sawmill or other plant manager.

In getting at the costs of holding land and growing timber it was necessary to study the methods of local taxation, the trends of assessment values and rates over a period of 27 years, the share of the tax burden borne by merchantable and cut-over lands, and their most recent sales price. A form drawn up by Mr. Hall, representing the Forest Taxation Inquiry which was called upon for advice and suggestions, was followed in going over the land and deed books to get this information.

Most of the field work was done by the middle of December. More information is needed on the areas of the main forest types by class of forest such as virgin, cut-over, etc., and by class of ownership, and on some of the other points not fully covered. As soon as the weather permits, Frank will return to the State and obtain the data still lacking.

A cooperative outline covering all phases of the program was drawn up in January. Mr. Peck, of the Bureau of Agricultural Economics, and Frank are now at work at their respective portions, and it is hoped that the report will be ready for editing by July 15.

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REPORT OF THE FOREST TAXATION INQUIRY

During April a conference was held on the subject of school finance and some further work on this subject planned for Herbert and Pingree.

Hammar submitted a tentative report covering the subject of road finance in Minnesota which was also discussed very thoroughly in conference. A general study of this subject was outlined to be completed by Hammar early in May.

We had the benefit of a visit from Mr. Marsh from the Washington office who stayed with us from April 5 to 10, during which time the work of the organization was reviewed, conferences were held on the school and road studies and plans were made in some detail covering the work of the different members of the staff for this spring.

Murphy is supplementing his digest of forest tax legislation now in force in the different states by making a historical summary of previous legislation on this subject in each State. This work involves a great deal of searching in the codes and session laws of the states.

Hall was out of the office during the last half of the month for the purpose of attending to a number of matters in Washington and to assist in the further development of plans for a study of forest taxation by State agencies in North Carolina. He spent three days in Raleigh, N.C., during which time he had informal conferences with Mr. Holmes, State Forester, Mr. Curran, Extension Forester, Dr. Joseph Hyde Pratt, and others interested in forest taxation, gave a talk on this subject at a meeting of the Kiwanis Club, and made a statement before the Tax Commission at an informal hearing on this subject.

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RANGE RESEARCH

Washington

Both Mr. Nelson and Mr. Culley continued their compilation and analysis in connection with their manuscripts.

Other Manuscripts

Campbell and Canfield on the Jornada have been getting out a considerable number of excellent news items during the winter. In a heavier vein they had published in Ecology early this year "An improved pair of shears for clipping studies on quadrats." More recently Mr. Campbell submitted a paper for Ecology or the Botanical Gazette entitled, "The mesquite sand dunes of southern New Mexico." Finally, Mr. Canfield has submitted "Solid stems in certain Jornada Range Reserve grasses."

Mr. Forsling submitted a paper for The Producer, "The spring range problem." He also submitted an article for publication in Soil Science or the Journal of Forestry entitled, "The soil protection problem."

Mr. Dayton prepared and submitted a paper for The Producer entitled, "some outstanding weeds of western cattle ranges."

Department Circular 33, "Soil erosion, a national menace," by Mr. H. H. Bennett of the Bureau of Chemistry and Soils and Mr. Chapline was issued during the month. About a hundred and sixty copies were sent out from here to prominent stockmen, stockmen's representatives, and others particularly interested. A number of very favorable comments have been received on the circular. Chapline's article on kidding was published in The Angora Journal for April under the heading "Care of young means increased profit."

Junior Range Examiner Examination

Twenty-seven candidates took the examination for Junior Range Examiner this year. Practically all were from the western schools.

A Computing Chartograph

Mr. Canfield submitted this spring plans for attaching a planimeter to the arm of the Hill chartograph with a view to reading directly areas of clumps in the field as they are charted. The matter was submitted to Mr. Witherow of the Branch of Engineering to consider the engineering features of it, and he has just recently stated that he believes the principle can be developed on a sound basis.

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FORAGE INVESTIGATIONS

Report on Elements

As chairman of the special committee appointed by Col. Greeley, Dayton finished his report to the Forester on the elements on which members of the Washington office are graded in efficiency ratings.

Dr. Marsh's General Bulletin on Poisonous Plants to be Reissued

Dr. Marsh's general bulletin on poisonous plants has been pretty thoroughly revised and is now in Dr. Coville's hands for review. At Dr. Coville's request Dayton has gone over this, especially with regard to nomenclature.

Report on Common Names to District 4

A long list of plant names intended for adoption in District 4, and submitted from that District, was gone over and checked, and two conferences with Dr. Coville were held by Dayton on certain of the items involved.

Routine Plant Identification Work for April

This was a busy month. 857 plants, representing 20 collections, were reported to the field and 78 photostatic prints of economic notes were furnished. Preliminary reports were made on 5 collections, representing 26 plants. 667 specimens, representing 17 collections, were sent to the Bureau of Plant Industry for identification. 442 plants were mounted.

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District 3

An attempt has been made to clear up work in the Tonto Forest region in preparation for the transfer of headquarters to Flagstaff, Arizona. Project work in the timber type will gradually absorb the most of our time, while that in the browse types will hereafter be cared for by field trips, rather than by living with it as we have in the past.

It has been abnormally warm and also exceptionally cold during the month of April. The very favorable year of 1927 and a good early winter are reflected in the condition of browse vegetation particularly; however, south central Arizona ranges I have never seen dryer at this season of the year. February precipitation was abnormally low. March and April have been practically rainless.

Under such draughty conditions the value of climax vegetation is outstanding. Spring annuals have been a failure. The danger of depending on a good production of annual feed and a consequent stocking resulting in the utilization of browse, that should under correct use be emergency feed, is particularly noteworthy. Under such use emergency feed, that should be present as unutilized browse, is gone before the emergency is over. Ranges on which herbaceous forage is correctly used need not be a cause for anxiety. Should the droughty condition continue until the period in which summer rains may be expected, there will probably be but little stock loss on range used somewhat too heavily to secure revegetation of palatable herbs. The real loss will be one of range. Understocking has been the popular cry where browse was conservatively used in 1927, but 1927 was a very favorable year. The range on which emergency feed was well utilized in 1927 is fast losing all that it gained vegetatively during the past two favorable years. The loss results from destruction of forage reproduction, seriously overgrazed grass, and partially defoliated and heavily pruned palatable shrubs. In seasons like the present one it is not unusual for twig growth of one or two years past to be taken from highly palatable shrubs.

So called climatic abnormalities are the rule, not the exception. Stocking on a basis of full utilization of forage and emergency feed in the good years has contributed most to overgrazed conditions and the resultant loss of feed and soil on the semi-desert browse range lands of the Southwest.

Copple and Cooperrider attended the meeting of the A.A.A.S., Southwestern Division, in session at Flagstaff, Arizona, April 23

to 26. The field trip conducted by the Forest Experiment Station and Grazing Research was very well attended by members of the Biological section, the trip actually amounting to a field-day demonstration.

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GREAT BASIN STATION

Field work for the season began on April 27. Walter E. Mann is looking after the measurement of runoff and erosion from melting snow in the watershed study and Selar S. Hutchings has been loaned to the Station by District 4 to substitute for Nelson until he returns from Washington about May 15 in obtaining plant development records on the early range. The snow cover above 9000' elevation and on the watershed study areas was somewhat below normal for the season. On April 1 it appeared that it would be approximately average by the end of the month; however, some melting without runoff and light snowfall during the month resulted in a storage of snow somewhat below normal. Surface runoff at 10,000 feet elevation began on April 28 and with favorable melting temperatures is continuing at a rapid rate.

Visitors

W. B. Miller, formerly in Grazing Studies in District 4 and now with L. J. Palmer on reindeer investigations of the U. S. Biological Survey in Alaska, was an office visitor late in March. He is getting information on meteorological methods and equipment for use at the reindeer experiment station near Fairbanks, Alaska. Mr. Miller gave a very interesting account of the work Palmer and he are doing up there. They expect to study all phases of reindeer production with the view of determining the full possibilities of the use of these animals for meat production for Alaska.

Meetings

The Utah Cattle and Horse Growers' convention was held in Salt Lake City, Utah, on April 5 and 6. President MacFarlane emphasized the need for more range research. Dr. Geo. Stewart of the Utah Agricultural College told the stockmen they were slow in asking for more range research work and that the only reason the dry farm-

ing industry, which is not nearly so important in this region as range livestock production, was receiving much more money for experimental work was because the farmers were back of getting money for the work and the stockmen had not awakened to the need.

Aspen Treating Plant

A creosoting plant will be installed this year in cooperation with District 4 for treating aspen posts and poles used at the Station. Quite a number of posts are used each year for fencing plots, and pastures. In the past untreated aspen and alpine fir has been used for this purpose in spite of the fact that replacement is necessary after from 4 to 8 years. It has been figured that replacement or resetting of posts was cheaper than treating where the supply of the timber used is so abundant and convenient as in the vicinity of the Station. However, the readily accessible supply of native juniper for posts in Utah has become so nearly exhausted that farmers and ranchmen are forced to pay high prices for such material and will soon be forced to turn to other species for posts. The treating plant at the Station in addition to lengthening the life of the posts used will serve as a demonstration for the many visitors who come to the station each year.

Utah Winter Ranges

Forsling, in company with Supervisor J. W. Humphrey of the Manti National Forest, made a trip over a portion of the open public domain desert winter range in western Utah and eastern Nevada during the period May 6 to 9. The trip gave a good idea of conditions as they exist at this time of the year and was considered well worth while. A distance of 640 miles was traveled. A number of photographs were taken and about 40 plant specimens were collected. The season was a little too early for finding much of the desert flora in the proper stage of development for collecting desirable herbarium specimens. Sheep were coming off the range in excellent condition, a result of a combination of fair forage production last year and a mild winter with just enough snow to afford plenty of water. At the time the trip was made the range was dry and prospects at present are for a poor forage crop this year.

The plant species which afford the bulk of the feed on the desert range are winter fat (Eurotia lanata), several species of shad scale (Atriplex spp.), grease wood (Sarcobatus vermiculatus), common sage brush (Artemisia tridentata), black sage (A. nova), bud sage (A. spinescens), several species of Chrysothamnus and various other shrubs. The shad-

scale and greasewood occupy the tighter clay soils containing some alkali content while sage brush, a green chrysothamnus and winter fat are more common on the more gravelly, better drained soils. Winter fat occurs rather extensively on the better soils. At the present time it was furnishing by far the bulk of the feed for the cattle found using the range.

Grasses are comparatively sparse over the entire area although they evidently were much more abundant on the better soils at one time having been destroyed by bad grazing practice. Those found include Galleta grass (Hilaria jamesii), rice grass (Oryzopsis sp.), three awn (Aristida sp.), needle grass (Stipa comata?), Nevada bluegrass (Poa nevadensis) and dropseed (Sporobolus sp.). Salt grass (Distichlis spicata) is common on the saline soils bordering the Salt Lake desert.

There are numerous weed species on the desert but they furnish but little feed for winter grazing since they have dried up and disappeared during the main season of use. However, in wet, warm falls and in early springs some weed feed is available. Sheep must subsist on the browse for most of the winter but appear to do well on it when there is a variety of species and the weather is not too severe. It appears that with the exception of winter fat and a few others, moderately to fairly closely grazed, browse plants furnish the best and probably the most feed. Such plants send forth fresh growth that is quite palatable and readily eaten. On ungrazed specimens the foliage and twigs are so coarse as to render them more unpalatable. This appears to indicate that a degree of use which would utilize the shrubs to a point that would not injure their vigor should result in the best forage production.

The browse range appeared to be in good condition at places remote from permanent water where it can not be utilized except in mid-winter when snow is available. All areas near watering places, however, where sheep are concentrated in the fall and early winter before snows occur or where summer grazing by cattle takes place, are suffering from overgrazing and too early use in the spring.

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JORNADA RANGE RESERVE

Range Conditions and Precipitation

Very little rain fell on the Reserve during April, and west winds were steady, so that little available moisture is left in the soil. The spring weed crop is deficient to date, although the loco has been in bloom for some time.

Condition of Stock

Stock on the Reserve are in fairly good condition as a result of ample feed. Cattle on outside ranges are poor, and considerable supplementary feeding is being done to stop the starvation losses which have occurred scatteringly during the spring.

The Jornada bulls are being fed a small ration of concentrate, to bring them into the breeding season in good condition.

Investigative Work

Considerable compilation and analysis of the clipping and snakeweed studies was done in preparation for the Datil Ranger Conference. Campbell spent several days in arranging a cross index and an index by families for the Jornada herbarium.

Solid Stems in Grasses

Canfield submitted his paper on "Solid Stems in Certain Jornada Grasses" to the Washington Office. This article is planned for publication in the Botanical Gazette or in a similar scientific journal.

The paper supplements brief notes which have previously been made by Canfield on the subject. Forty-three species of the most important Jornada grasses are listed, of which 35 species, or 81.4%, were found to have solid stems in their development at this Station. The study includes a range of 7 grass tribes represented by 20 genera.

A microscopic study showed the portion of the culm which is usually hollow to be filled with pith. No vascular tissue was found interspersed with the pith. The studies are to be continued.

Datil Ranger Conference

The Datil Ranger Conference on grazing was held at the Station April 9 to 11, through the cooperation of officers of the Datil National Forest and some of the stockmen of the region. The group arrived by automobile Monday April 9 at Las Cruces. There were 12 men: F. L. Kirby, supervisor; B. A. Hendricks, Assistant Supervisor; E. L. McPhaul, S. Q. Garst, Jewell Wyche, H. Garvin Smith, J. A. Simmons, Carl Welch, and W. H. Koogler, Rangers; Floyd Ellington, Administrative Guard; Ed Dickens and Joe Pankey, stockmen.

The three days were spent in a thorough inspection and discussion of the Jornada projects, to the mutual benefit of the visitors and the Station personnel.

At the close of the conference, the Datil officers wrote summaries of the principles applied on the Jornada as they concern management on the National Forest. B. A. Hendricks, Assistant Supervisor, wrote the following:

"While the results on the Jornada Range Reserve are not directly comparable with results on national forest range, there are certain outstanding results on the Reserve which point toward principles of range management which would be applicable to forest ranges. The succession of inferior species following the disappearance of the important forage plants under overgrazing, and the succession of important forage plants coming in through the building up of the soil by inferior and unpalatable species under conservative stocking is a law of nature which applies to all vegetation. The value of conservative stocking is clearly shown on the Reserve, and the contrast between range on the Reserve and the public domain shows clearly the difference between controlled and uncontrolled grazing. This one principle of conservative use of the range, if gotten across to the stockmen of the state, would mean an enormous saving in our basic forage resources. It appears that the balance of nature is more delicate on the Reserve than on the forest and that the range can stand less abuse (partly due to the sandy soil) than the short grass ranges on the forest. However, owing to the quick recuperative power of black grama, the mesa grama type of the Reserve seems to come back more quickly than the short grass range on the forest, so it is doubly important for us to keep the forest vegetation in good condition.

"While the Reserve does not solve all the grazing problems which we run up against on forest ranges, particularly distribution problems concerned with the correction of localized overgrazing, it does show thatapplication of sound principles of management depend on having a range which can be controlled and which is conservatively stocked, especially allowing for periods of extreme drought. This tends to show that in order to get the best results on Forest range we must have our range blocked off into separate allotments and the different allotments conservatively stocked."

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The Editor

If anyone has wisdom to contribute on the high art of scientific writing, it should be one who, while keeping the respect of the technical man, has yet persuaded the man in the street to pay him a living in return for the production of scientific literature. In "Science" for April 13, 1928, Mr. Slosson expresses his views on "Unscientific Obscurity in Writing on Scientific Subjects." Although his treatment of the subject is by no means exhaustive, it may be helpful in emphasizing at least one phase of unscientific obscurity that may well be omitted from forest research manuscripts. Mr. Slosson writes:

> "Since it has been my lot for many years to earn my living by translating scientific literature into the vulgar tongue, I have often wondered why the writers made it such hard work to read the original language.
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> "If the difficulty were due to the profundity of the thought or complexity of the reasoning, then it could not be avoided. But I have found that important papers by the deepest thinkers were apt to be easier to follow than those by minor men dealing with comparatively trivial topics.
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> "Nor does the cause of the obscurity lie, as is commonly said, in the use of technical terms. The sports section or fashion page of a newspaper has as specialized a vocabulary as a scientific paper. Many scientists do indeed employ technical language unnecessarily in writing for the outside public, but even where the words are all familiar the meaning may still be obscure.
>
> "I have come to the conclusion that the chief reason why scientific literature offers such high resistance to reading is the use of the alternating current instead of the direct in conveying the thought. The writer interposes a negative every few words that reverses the meaning of the sentence. This keeps the reader on the jump.
>
> "The asymptotic ideal toward which scientific writing tends is a sentence structure something like this:
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> "'The present writer is indisposed to deny that he is unconvinced of the necessity of refusing to accept the infrequency of negative reactions as a not insuperable argument in disproof of the theory.'

"Such sentences may be quite logical and free from technical terms. They can be disentangled in time and when straightened out the meaning may turn out to be something simpler than it sounds. But they are constructed like the Chinese boxes, when you get one opened you come on to another. The process of extracting the meaning is like the simplification of a complicated algebraic equation, and in extricating the internested parentheses you are likely to come out with the plus and minus signs mixed."

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